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ABSTRACT

This report of a conference held at University College in Dublin explores problems associated with cooperation and computer applications involved in networking. An introductory session on the theory and objectives of physical and cooperative networking by Lucy Tedd, a consultant on computer systems in libraries, is followed by Dennis Jenning's report on a University College project to establish an experimental packet switching telecommunications network in Ireland. A review is presented by Patrick Kelly, a director from the Institute of Higher Education, on automated cataloging systems in Ireland, including cooperation between academic, special, and public libraries in Ireland and the British Library and the Birmingham Library Cooperative Mechanization project. Other papers include a review of cataloging networks outside Ireland (mainly in the United Kingdom) by Lucy Tedd and a description of the Euronet-DIANE information retrieval network by Barry Mahon of the network. The papers are followed by a general panel discussion. Included are a list of contributors and a list of participants along with a brief table of abbreviations. (Author/RAA)

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DEPARTMENT OF LIBRARY AND INFORMATION STUDIES

OCCASIONAL PUBLICATION NO. 1

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APPLICATIONS OF NETWORKING IN IRISH LIBRARIES

PROCEEDINGS OF A CONFERENCE

held on 13th March, 1980 in the

DEPARTMENT OF LIBRARY AND INFORMATION STUDIES
UNIVERSITY COLLEGE, BELFIELD, DUBLIN 4

EDITED BY MICHAEL CASEY

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UNIVERSITY COLLEGE DUBLIN DECEMBER 1980

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EDITOR'S NOTE

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Dr. Dennis Jennings, Director, Computer Centre, UCD.

Mr. Patrick Kelly, Director of Library Services, NIHE, Limerick.

Mr. Barry Mahon, Head, EURONET DIANE Launch Team,
Commission of the European Communities.

ABBREVIATIONS

(used for some organisations and committees in Ireland, referred to in the text or represented at the conference)

AFF	An Foras Forbartha (The National Institute for Physical Planning and Construction Research)
AFT	An Foras Taluntais (The Agricultural Institute)
AnCO	The Industrial Training Authority
CII	Confederation of Irish Industry
DCC	Documentation Coordinating Committee
DCL	Dublin City Libraries
HEA	Higher Education Authority
IADIS	Irish Association of Documentation and Information Services
IIRS	Institute for Industrial Research and Standards
IMI	Irish Management Institute
NBST	National Board for Science and Technology
NIHE	National Institute for Higher Education
NUU	National University of Ulster
P & T	Department of Posts and Telegraphs
QUB	Queen's University, Belfast
RIA	Royal Irish Academy
SPCM	St. Patrick's College, Maynooth
TCD	Trinity College, Dublin
UCC	University College, Cork
UCD	University College, Dublin
UCG	University College, Galway
UP	Ulster Polytechnic

INTRODUCTION

Dr. Thomas Murphy, President, UCD.

Good morning ladies and gentlemen and welcome to this seminar on Networking in Irish Libraries. I am delighted to meet you all. It is a great source of satisfaction to me to see so many librarians from so many different libraries. I would like to welcome all our speakers, especially our visitor from Aberystwyth. Indeed it was shortly after I became President, when we were considering the extension and building up of a new Department of Library and Information Studies, that I visited some similar organisations in Britain, one of which was the College of Librarianship at Aberystwyth. I think we in UCD have a long way to go before we have a Department as large as Aberystwyth, but it was most interesting and gave me a lot of useful ideas.

In due course we progressed with the appointment of John Dean as Professor of Library and Information Studies and of other members of staff. I would like to take this opportunity to thank all of them for developing so much so quickly. The procurement of funds for the Department has been a slow process, but I must say that we have received the full support of the Higher Education Authority. Although we have not quite met the full needs of Professor Dean's Department we are coming fairly close to it until the next stage of expansion occurs. I will conclude by wishing you every success in your deliberations. I hope we will see you again and again over the years. You are very welcome.

Professor John Dean, Head, Department of Library and Information Studies, UCD.

Ladies and gentlemen, it would be appropriate at this juncture to mention that Dr. Murphy's keen support and interest in this Department has been a major factor in our development over the past two years, and we are much indebted to him.

We have with us today a number of very distinguished speakers - Lucy Tedd, formerly of the College of Librarianship, Wales and currently a consultant to the British Library. Lucy Tedd has actually been with us for several days and we have been working her hard. She is on her fourth seminar now, if not fifth: Barry Mahon is Head of the EURONET DIANE Launch Team in Luxembourg; Pat Kelly is Director of Library Services at NIHE Limerick; Colin Barnes is Deputy Librarian, University College Cork; and UCD is represented by Dennis Jennings, Director of our Computer Centre.

The topic for today's conference has been chosen with some care. It is of vital importance at the moment in every sector of library activity. The library world is no longer safe and silent, leisurely tapping the cells of knowledge. It is confronted on every hand by a host of testing challenges and today we shall look at a number of the problems associated with cooperation and computer application and hopefully clarify at least some of the issues involved.

The first item on the programme is Lucy Tedd talking on "Networking - Theory and Objectives", and I can think of no one better qualified to deliver this paper. She will be widely known to you through her book *Introduction to Computer-Based Library Systems**, which is one of the few textbooks notable for its clarity on the subject. She is also engaged at the moment upon a consultancy for the British Library in the area of networking. I have great pleasure, ladies and gentlemen, in introducing Lucy Tedd.

* *TEDD, Lucy A., An Introduction to Computer-Based Library Systems, 2nd edition, London, Heyden, 1980.*

NETWORKING - THEORY AND OBJECTIVES

Lucy Tedd

The Oxford English dictionary defines a *network* as *a piece of work having the form or construction of a net, or a collection or arrangement of things resembling a net* and it goes on to quote from the Bible - *they that weave networks shall be confounded.* Elsevier's Dictionary of Library Science, Information and Documentation is more specific and refers to *a series of points interconnected by communication channels.* There are many interpretations of the word *network* in the field of library and information science. Some writers on the subject incorporate the concept of communication and resource sharing between independent organisations, while others view networks in the more limited context of computerised systems.

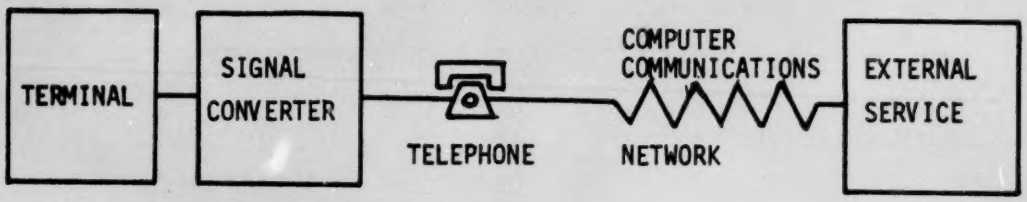
I propose to deal with the *physical* and *logical* aspects of networks in the library context. The physical aspects include communications networks used by libraries to access remote computers. Examples include ESANET, the European Space Agency Network, and American networks such as TYMNET and TELENET, used for online access to LOCKHEED and SDC databases. The logical aspect of networks is concerned with cooperation between libraries. The Birmingham Libraries Cooperative Mechanisation Project, BLCMP, is an example of a library cooperative system. Although many American writers would refer to BLCMP as a network, I consider it to be a cooperative system because it does not involve any special telecommunications.

Physical Aspects of Networking

In considering the physical aspects of networking I will focus on library usage of external computer facilities for online searching. This is the application for which most libraries use communications systems. The equipment necessary for communication between a library and an external service is summarised in Figure I.

FIGURE I

EQUIPMENT FOR TRANSMITTING DIGITAL INFORMATION VIA COMMUNICATIONS NETWORKS



Equipment requirements include a terminal, which may be a *non-intelligent* terminal (NIT) (e.g. a teletypewriter or visual display unit), or an *intelligent* terminal (e.g. a micro - or mini-computer). A telephone and signal converter are two other essential pieces of equipment. A signal converter, i.e. a modem or acoustic coupler, converts digital signals, generated at a terminal, to analogue form for transmission via a telephone and communications network to an external service.

It might be useful, at this stage, to explain some technical terms used in physical networks. *Duplex* and *half duplex* are terms used to specify modes of transmitting information from one point to another in a communications system. In duplex mode messages may travel in both directions simultaneously. In half duplex mode, however, messages may travel in only one direction at any one time.

Message switching and *packet switching* are terms which are also used in the context of transmitting information along a network. In the case of message switching a *whole* message is sent at one time from a sender to a recipient. In packet switching a message is split into packets and each packet may be sent by different routes along a network. Packets must be reassembled before the recipient can

interpret the message.

To explain more fully the concept of message switching and packet switching I will use the analogy of posting a letter of, say five pages, from Aberystwyth to Dublin. If the letter is sent by message switching all five pages would be placed in an envelope and forwarded by post. The recipient would be presented with all five pages (i.e. the whole message) at the same time. If, however, the letter is sent by packet switching it would be divided into packets of, say one page long, and each page would be sent by a different route. The first page might be dispatched via Holyhead to Dublin, the second page via London, the third page via Cardiff, the fourth page via Fishguard and the fifth page via Liverpool to Dublin. Each page would contain the name and address of the recipient and would arrive in random order. To interpret the message the recipient would need to arrange the pages, or packets, in the correct order.

Using this analogy one is tempted to ask why packet switching is used to send messages. It appears to be cumbersome and inefficient. The reason is that computers and networks are capable of sorting and transmitting digital information very quickly and packet switching is a means of making the most efficient use of telecommunications links between the various nodes of a network.

The term *protocol* is also used in the context of physical networks. A protocol is used to describe the way in which messages are broken into packets and later reassembled into messages. Protocols are also used to describe the method of linking a terminal to a host computer through various nodes of a network. There are various protocol standards in existence, for example, X25 which is used for EURONET.

Another technical aspect is the speed at which messages are transmitted. This is measured in *baud* or bits per second, a bit being a binary digit (i.e. 0 or 1). Most systems currently operate at either 110 or 300 baud, which is equivalent to ten or thirty characters per second respectively. There are, however, developments within the networking field which make it possible to achieve a transmission

speed of 1200 baud.

FIGURE 2

EXAMPLES OF COMPUTER COMMUNICATIONS NETWORKS

ARPANET	SCANNET
ESANET	TELENET
EURONET	TYMNET
IPSS	TRANSPAC

Figure 2 is a list of some computer communication networks available at the moment. ARPANET is a large experimental network used to link government and research organisations in the United States. At one stage it was used in the UK to access the US National Library of Medicine search system. It was also instrumental in the design of other commercial networks in America.

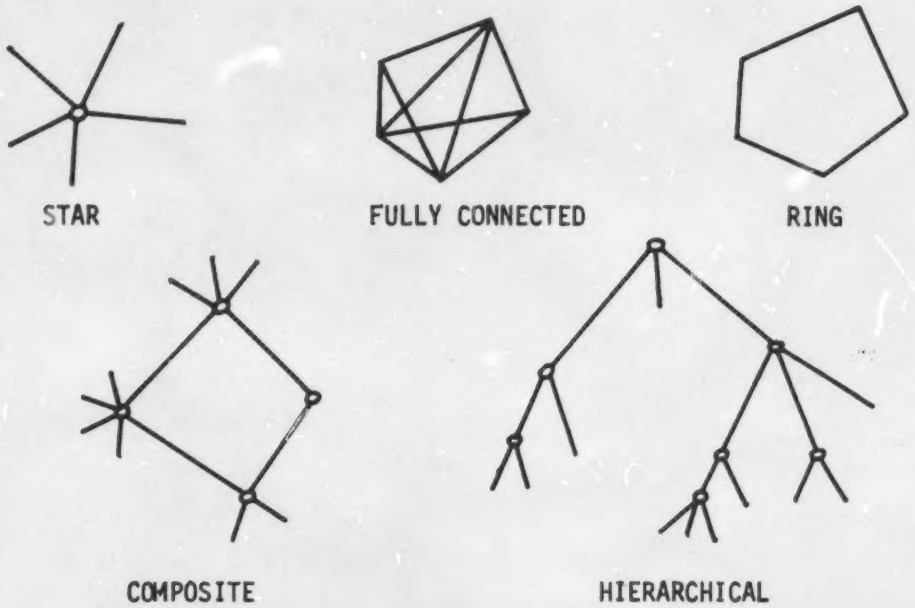
Other examples include ESANET, the European Space Agency network; EURONET, which will be described later by Barry Mahon; IPSS, the International Packet Switching network; and SCANNET, a Scandanavian network linking Norway, Sweden, Denmark and Finland. There are plans to link SCANNET to EURONET. This is an interesting development because the introduction of links between two or more networks will result in improved access to a wide range of external services.

TELENET and TYMNET are two commercial American systems. Both are used in the UK, via IPSS, to access online services such as LOCKHEED and SDC in America. The French system, TRANSPAC, is another example of a packet switching network.

The various types of networks in existence at the moment are illustrated in Figure 3. Examples of network structures include star, composite, fully connected, ring and hierarchical networks.

FIGURE 3

NETWORK STRUCTURES



EURONET (Figure 4), a physical network linking the member states of the European Community, fits into the composite category. There are four major nodes in London, Paris, Frankfurt and Rome. From London there are separate links to Dublin and Amsterdam. Paris is linked to Brussels and Luxembourg and there is also a line from Frankfurt to Copenhagen.

Online users do not necessarily need to know the route by which messages are sent and received. For example, a person in Ireland wishing to use the ESA online service would simply dial the Dublin telephone number for EURONET and would be automatically connected to the ESA computer in Frascati via London through the network to Rome. Alternatively one could use ESANET to access the ESA computer.

FIGURE 4

EURONET STRUCTURE

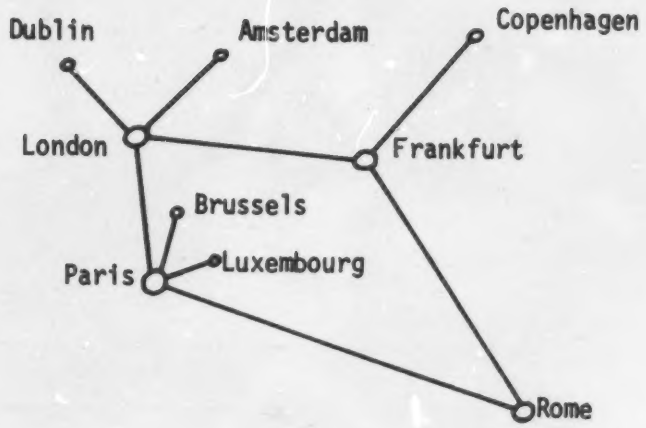


Figure 5 is a diagrammatic representation of the British Post Office's IPSS link to TYMNET and TELENET. A person in the UK, wishing to access the LOCKHEED or SDC computers, must first connect, by means of the UK telephone system, to the London packet switching exchange (PSE) where messages are assembled and disassembled into packets. The message is then transmitted across the Atlantic to New York by one of three cables owned by three different organisations, ITT, RCA and WUI. It then proceeds to the ITT or RCA or WUI packet switching exchange. From there the message is transmitted, via TYMNET or TELENET, to the required host computer. The same procedure (in reverse) occurs when messages are sent back to the searcher by the host computer.

FIGURE 5

IPSS LINK TO TYMNET AND TELENET

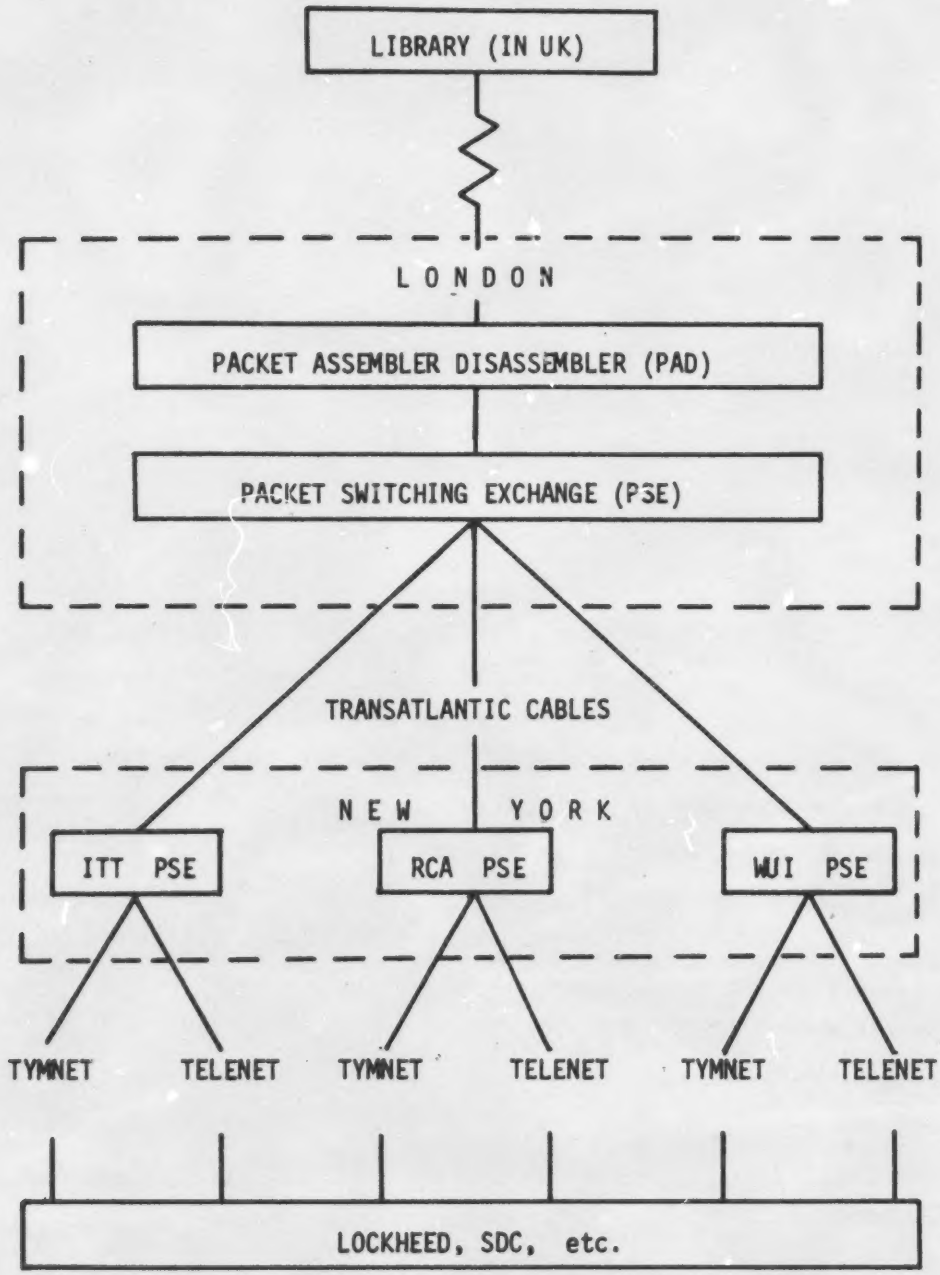


FIGURE 6

EXAMPLE OF LOGON PROCEDURE TO LOCKHEED VIA IPSS

AZ	terminal identifier
+ LONPSC-102	
NCLWSEEKS	network user identifier
A 31060061*DLRRS;IPSSLON	'address' of host computer
COM31060061	
TC HOST IS ONLINE	message from TYMNET indicating host computer is 'up'
ENTER YOUR DIALOG PASSWORD	message from host computer

The LOGON procedure to LOCKHEED is illustrated in Figure 6. A user must enter a terminal identifier, a network user identifier, the 'address' of the host computer required and finally (if the host is online) a LOCKHEED user password. The LOGON procedure is quite long and tedius and many people find it offputting, particularly when things go wrong. Unfortunately, however, it is necessary for security reasons and for accounting and billing procedures.

Logical Aspects of Networking

The second area of networking which I propose to deal with is library cooperation. Libraries cooperate for various reasons. For example cooperative networks are often established to provide library users with access to a wider range of materials and services. Alternatively, library cooperatives may provide the same standard of service at a lower cost or more services at the same cost as previously. Cooperation may also result in the provision of a wide range of services which could not be made available by individual libraries at a realistic cost.

Library functions which are supported by cooperative systems include the following:

- catalogue production and maintenance
- access to bibliographic records
- provision of reference services
- interlibrary loans
- document supply services
- acquisitions and order control
- circulation control
- control of periodicals

Some examples of library cooperative systems in operation at the moment include:

- BLCMP, the Birmingham Libraries Cooperative Mechanisation Project
- SCOLCAP, the Scottish Libraries Cooperative Automation Project
- SWALCAP, the South Western Academic Libraries Cooperative Automation Project
- OCLC, the Ohio Colleges Library Centre, and
- WLN, the Washington Library Network

If a major problem arises in a library, a full system analysis should be carried out to analyse the situation. The solution may or may not involve the introduction of a computerised system. If it appears that the problem may be solved by joining an existing library cooperative it is essential to ask the following questions:

- do the services offered by the cooperative satisfy the current and future requirements of your library?
- how much does it cost?
- how many members are there?
- is the cooperative well established?
- what control have members in governing the cooperative?
- what enhancements are planned?
- how reliable is the cooperative. Is the system working most of the time or are there frequent breakdowns?

- what assistance is provided in setting up? A number of cooperatives are extremely helpful at the implementation stage.
- what do existing members think of the services?

The establishment of a new cooperative is another possible solution to problems shared by a number of libraries. Some general decisions concerning services, standards and control need to be made at the outset. For example:

- what services are to be offered by the cooperative? Services might include cataloguing, acquisitions, orders, circulation and periodicals.
- what types of libraries are to be served? The cooperative might be intended for all types of libraries or restricted to a particular type, e.g. academic libraries.
- what standards are to be adopted? If a cooperative is to be successful it is essential that all standards be clearly specified and agreed upon. This is particularly important in the case of cooperative cataloguing systems. If member libraries create catalogue records according to different standards the cooperative will eventually disintegrate.
- what authority control is required?

Other decisions required are those concerned with management, financial and technical aspects of the cooperative. For example the following points need to be explored and clarified when deciding on management:

- who is to govern the cooperative?
- what type of government structure is to be adopted?
- who will sign contracts and approve expenditure?
- to what extent will members be involved in decision making?
- what type of membership structure is acceptable? For example, SCOLCAP distinguishes between full membership and associate membership.
- who will decide on charges for services?
- what support staff are required to develop and operate services?

Financial and technical considerations, which should be taken into consideration when setting up a new cooperative, include the following:

- what will be the cost of developing and operating the cooperative?
- how many members are required for it to be self-sustaining?
- what type and size of computers are needed to operate the proposed services?
- whose computers will be used?
- what type of terminal will be supported by the cooperative?
- should external software be acquired?

I will conclude by quoting from a paper[1] by Constantine Solomonides which is to be published in the next issue of Program.

> *"The most important change for the user that networks will bring is the ease with which he can access a variety of services from a single terminal. At the transmission end current technology already offers mechanisms for improved reliability and better utilization of resources. Although not yet widely available they are being installed with speed and by the mid eighties they will be providing a comprehensive international service. The networking facilities will continue to improve and hopefully will also provide a cheaper service to their subscribers although service costs in Europe in particular depend on the budgetary policy of the Post Office organisation. In many cases such policies have to take into account factors other than the cost of a particular service".*

I hope I have given you some idea of the physical and logical aspects of library networks. I will be very pleased to answer any questions during the panel discussion.

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AN IRISH PACKET SWITCHING NETWORK

Dennis Jennings

The Networking Situation in Ireland

Physical networks of the type described by Lucy Tedd do not exist in the Irish Republic. There are, however, networks in the traditional sense i.e. a number of terminals connected to a central computer, and some of these are quite sophisticated. Examples include the Government Central Data Processing Service, CDPS, and our own UCD network, both of which are of the star type.

In UCD we have a large time sharing interactive computer system comprising two computers and approximately one hundred terminals. Both computers are located in Belfield. Terminals in Belfield are linked to one computer by local lines on the campus, while those in Merrion Street are connected by multiplexers and leased lines on the P & T public switched telephone network. The most recent addition to the system is a multiplexer in Earlsfort Terrace. This is a statistical multiplexer on a dual guide facility using two telephones. It supports eight fairly high speed terminals over a fairly low speed dual dial telephone circuit. We also have a number of remote job entry terminals which use leased lines and dial-up modems.

There is no packet switching network in Ireland at present. As far as I am aware there are no immediate plans for such a network, although the P & T appears to be making plans for 1982. There are, however, two access points in Ireland to networks overseas. A multiplexer in Dublin connects Ireland, via a leased line, to the London node of EURONET. At the moment the Dublin multiplexer has one high speed networking port and a number of low speed ports, and is to be expanded this year to multiple X25 EURONET ports. There is also an access point in Dublin to ESANET, the European Space Agency Network. Later this year it is planned to link Ireland, by means of a multiplexer, to the London node of the International Packet Switching Service, IPSS.

An Experimental Packet Switching Network

1. Summary of the Network Project.

Let us now focus our attention on an Irish Packet Switching Network and, in particular, on the NBST Experimental Packet Switching Network. In October 1978 a joint proposal was submitted to the NBST by UCD and TCD. I represented UCD and Michael Purser, an expert on networking in this country, was the TCD representative. I must state quite categorically that the proposal could not have been made without the involvement of TCD. The expertise of Michael Purser and his team of research students made it possible to prepare the proposal and undertake the technical aspects of the project.

One of the objectives of establishing an Irish packet switching network is to develop expertise in networking technology. At present Ireland is importing most of its technology. If we are to continue in this direction we need to develop sufficient expertise to at least have a basis for deciding what technology we should use. It is interesting to note that at a recent international conference on technology transfer it was argued that the main problem in this context in Third World countries is their lack of technical expertise and their inability to assess technology. I am not suggesting that Ireland is a Third World country, but the same argument regarding lack of expertise and inability to assess imported technology holds true for a small country like Ireland. It is imperative therefore that we develop some expertise in the networking field.

The second objective is to provide some experimental networking services. The major advantages of networking include sharing the cost of access to various services, sharing various services, and offering multiple services through one access point. We need to provide some experimental services to study the demand for services and the means by which they might be supported.

The third objective of the NBST Experimental Packet Switching Network is to provide a tool for network research in this country. The availability of such a tool will facilitate the development of expertise and will also promote higher level research.

The final objective of the proposed network is to provide a basis for the development of higher level experimental services, for example, database and cataloguing services.

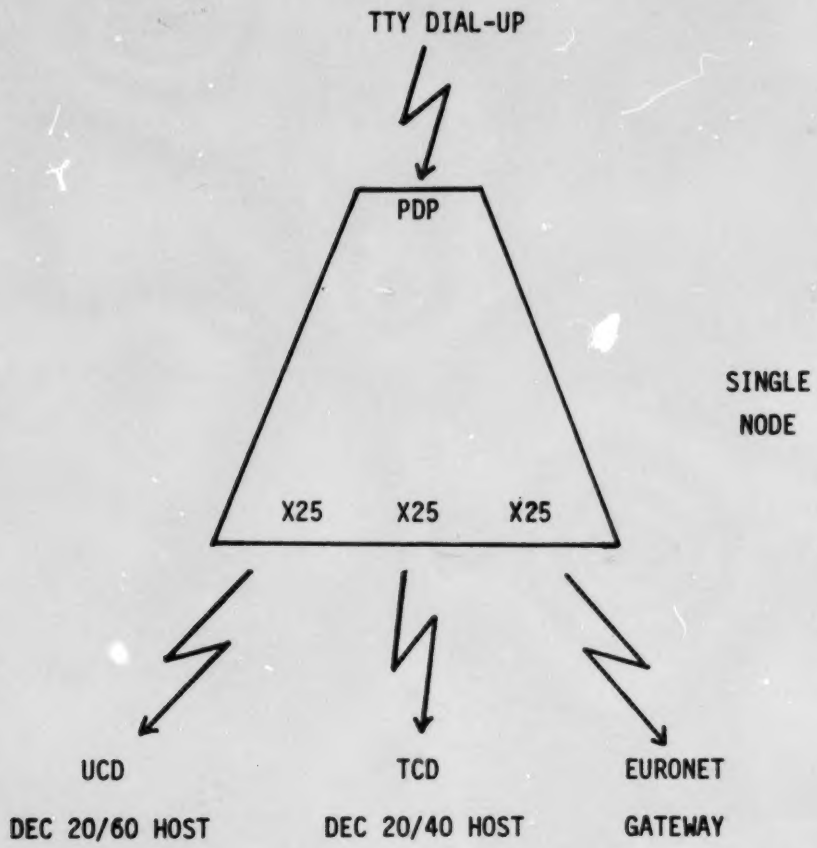
The proposal for the network project was made in October 1978, NBST approval was given on 25th July, 1979 and the equipment was ordered on 8th August, 1979. The participating institutions are the NBST, UCD, TCD and the P & T. We have not yet managed to get the P & T involved to the extent that we feel is necessary. We had a view that the P & T should try to benefit from this experience by involving one or more engineers as observers or participants in the project. Regretably this was not possible. We had also hoped for some participation by suppliers, but so far they have not been involved in any way on a company basis.

The personnel involved in the work include the NBST project leader, Jim Mountjoy, who has overall charge of the project, myself as consultant project manager representing UCD, and Michael Purser as consultant technical manager representing TCD. We also have one full-time project programmer, Mr. A. Patel, employed by the NBST on a twelve month full-time basis and working as a Ph.D. student at TCD under the direction of Michael Purser. We would have been unable to undertake the project on the basis of one full-time person working for one year if TCD had not already developed considerable expertise in this area.

Figure I is a diagrammatic representation of the proposed experimental network. Although it will consist of only one node it will be built as if it were a proper network. It will have the usual switching and routing facilities and will be based on, and compatible with, EURONET and X25 technology.

FIGURE I

PLANNED EXPERIMENTAL PACKET SWITCHING NETWORK



The major X25 connection will be to the EURONET node in London through the P & T multiplexer in Dublin. In fact we are the official users of the only X25 port in Dublin, but hopefully there will be more X25 ports available later this year. We also have plans for some X25 (or, let us say, multiple channel) links to the DEC 20/60 host computer at UCD, and the DEC 20/40 at TCD.

The UCD and TCD computers will serve as hosts and access to all EURONET facilities will be provided through the experimental packet switching network and the EURONET gateway. An alternative path to EURONET will be made available by means of dial-up terminal facilities. The network will be based on a small PDP11/34 computer and an RSX11M operating system. There will also be a tape drive and some discs and synchronous interfaces. The throughput of the interfaces will be quite low and they will be unable to support substantial traffic. If, however, we encounter traffic problems we will presumably have a successful experimental network in operation and the throughput will be improved as necessary.

The project is organised in two phases. Phase 1 will be a single terminal system which may be used to access BLAISE via EURONET. The purpose of the first phase in the development of the network is to enable a librarian to do more than he or she could normally do on a teletypewriter. Specifically, having searched for and identified particular MARC records, the librarian will be able to log these MARC records onto magnetic tape for subsequent use, or as Michael Purser put it at a recent international meeting, "to steal MARC records from the British Library". Phase 2 will involve the actual implementation of the complete network.

2. Progress to Date

Software

We have already developed most of the software on another computer but have not yet transferred it to the PDP 11 which we now have. The software has not yet been tested on EURONET because the latter has been made available only within the last few days, and the P & T multiplexer became operational only very recently.

Hardware

The hardware was ordered from DEC, the Digital Equipment Corporation, on 8th August, 1979, and we were quoted a three months delay period. It was not received however until January 1980. This indicates one of the problems which arise in a project like this, namely that one is limited by what a supplier can actually do as opposed to what he promises to do.

On the communications side, we requested the P & T to provide the necessary leased lines before Christmas 1979 and considered ourselves fortunate when they were eventually installed in March 1980. The host connections are currently under discussion because of the existence of a number of small technical problems. To be more specific, a front end computer is required to connect to a DEC 20 host. Both TCD and UCD have the appropriate front end computers and both are in day to day, hour to hour, minute to minute operational use as part of our existing old fashioned network. When I take off my consultant project manager hat and put on my normal workday hat, I am obliged to insist that the experimental network does not disrupt my working service. It was, therefore, not possible to use our existing front end computers for the network. One solution was to purchase another front end computer but the limited funds available for the project precluded this possibility. We finally solved the problem by adopting a fairly clever, although rather inefficient, trick. Instead of having an X25 multi-channel link, we propose to use a set of real links and to have them connected like ordinary terminals. This is what we will probably do in the first phase, but hopefully the network will be later extended to have a proper X25 port on the system. To a user of the network, or a user of EURONET, there will be no difference. He will see a host computer as if it were properly connected in the proper technical manner.

The original intention was to complete the project by the summer of 1980. Despite the setbacks I mentioned earlier we hope to have the work completed sometime in 1980. If we succeed it will

have been a remarkable achievement, due entirely to the technical expertise of the Computer Science Department, TCD. I emphasise this because it illustrates that the development of research and technology is possible in a community where there are willing individuals and cooperating university institutions.

3. Proposed Experimental Services

Access to EURONET via the Network

The first experimental service available on the proposed network will be access to EURONET. Although an access point to EURONET is already available in Ireland, the NBST network will be offered as an experimental service and hopefully it will work reliably and will provide more low speed ports to EURONET than would otherwise be available.

Access to UCD and TCD Host Computers via EURONET

An important experimental service will be access through EURONET to the UCD and TCD host computers. Looking to the immediate future, I am not sure who will actually use this service. In the long term however it is essential to explore the possibility of establishing Ireland as an exporter of information and an earner of revenue by facilitating access to host computers in Ireland via EURONET.

Access to BLAISE

Despite what Michael Purser said we do not intend to steal MARC records from the British Library. We hope to be able to transfer tapes of MARC records to the network computer or to host computers connected to the network. This could be done directly by simply viewing and selecting MARC records on BLAISE, requesting that they be transferred to our local host computer for further processing, and paying the appropriate royalties to the British Library. In fact we will not actually be able to do it on our own network

computer. One of our suppliers, DEC, delivered the equipment in January but failed to deliver the magnetic tapes and the project schedule has had to be adjusted accordingly.

EURONET Testing and Monitoring

A project to test EURONET and to monitor the availability of host computers and services throughout the network is at present under discussion with the Commission of the European Communities. A contract has not yet been finally agreed but I am hopeful that it will be awarded to the NBST. This contract, if secured, would provide revenue which could be used to fund further research on networking technology.

4. Potential Extensions to the Network

Network Links

We are considering the possibility of extending the network to other academic institutions such as UCC, UCG, St. Patrick's College, Maynooth, and possibly Queen's University, Belfast. I am very attracted to this idea because I believe there are people in these universities who would be keen and willing to share resources in this area with UCD. However, we have not actually approached anybody yet and although possible extensions are under consideration by us they are not, to my knowledge, being considered by potential recipients of our bounty.

Software Extensions

Some software extensions are also under consideration, for example, research on various high level protocols. The term *protoool* has the same meaning in communications as in diplomacy i.e. a formal set of rules for the interchange of information. X25 is based on a *hardware level* and a *link level*. There is a protocol associated with the link level to ensure that a piece of information, or

message, is transmitted from one point to another en route to its final destination. An *end to end* protocol is another level of protocol. This is a formal set of rules for transmitting messages, via specific links, from one end to another end of a network. The next level of protocol is the *user to user* protocol. This is a protocol to transmit messages from one user or program or operator from end to end to another user or program or operator. X25 goes to level 3, which is not very high in the protocol hierarchy. There is a need to carry out further research and to gain practical experience in high level protocols and we hope to use the network for this purpose. There is obviously potential conflict between research in this area and the provision of experimental services, but hopefully the problem will be resolved when it actually arises.

Experimental Services

As librarians you are probably more interested in the use of the network for the development of higher level services such as information retrieval and database systems and cooperative library cataloguing. All of these areas are currently under consideration.

The provision of information retrieval and database systems is not necessarily directly concerned with the network project, but we are very keen to cooperate with anyone who has an interest in this area. For example, we would be interested in being involved in a number of projects to put up databases on an Irish host computer and to provide an information retrieval service both locally and on EURONET via the NBST network. I am confident that there will be developments in this field in the near future and that we in Ireland will be providers as well as users of information retrieval services. There is already considerable interest in information retrieval systems in this country and it is up to the interested parties to prepare proposals and undertake projects. This has already been done in the area of legal information by the Department of Library and Information Studies at UCD.

Cooperative library cataloguing is another area for potential development, and in particular, cooperation between academic libraries to share cataloguing information and perhaps produce a union catalogue. The Higher Education Authority is currently interested in this area, possibly because it views it as a means of saving money. However, although cooperative cataloguing may not actually save money, it is an effective way of providing a more extensive library service. There is considerable pressure on us at the moment to become involved in cooperative cataloguing as soon as possible. It is not a trivial area and is not something which can be rushed into because it involves the cooperation of a large number of people.

I will conclude by stressing that the proposed network will be a communications network, physically linking users and programs. It will serve as a basis for cooperation between libraries and for the provision of the types of services I have outlined. The ultimate success of the network in the library context will depend on the willingness and determination of librarians to exploit it as fully as possible.

STATE OF THE ART OF LIBRARY NETWORKING OVERSEAS

Lucy Tedd

Having concentrated in my first paper on the physical aspects of networks I now intend to focus on logical networks or cooperatives. However, before dealing with specific library cooperatives, I should mention that a survey is at present being carried out by Stella Keenan of Loughborough University and Alina Vickery of the University of London. The purpose of the survey is to study intermediaries in Europe, to collect statistics on their experience, qualifications and training, to ascertain what systems they are using and to obtain some general background information. The study is not yet completed and questionnaires are still being received by the survey team. Preliminary results, based on 184 replies, have revealed some interesting facts on the use of information systems accessible through various networks. Of the responding organisations 70% use LOCKHEED, 44% use ESA/IRS, 40% use BLAISE, 33% use SDC and 19% use INFOLINE. Another result which may be of interest concerns types of organisations using these external services for online information retrieval. The preliminary findings were as follows: industry and commerce 33%, universities 27%, research institutions 11%, government 9%, polytechnics 7%, public libraries 6% and others 7%.

Library Cooperatives in the United Kingdom

BLAISE LOCAS

The British Library Automated Information Service, BLAISE[1], is an information retrieval and cataloguing service. LOCAS[2], the Local Cataloguing Service, has about thirty users and includes various types of libraries in the UK and overseas (including Ireland). By linking to BLAISE LOCAS member libraries may interrogate and edit catalogue records online, followed by offline catalogue production on microfiche. However, BLAISE LOCAS is not a truly cooperative system because the British Library decides what services are to be offered and members

are simply users of these services.

BLCMP

The Birmingham Libraries Cooperative Mechanisation Project, BLCMP, originated with only three libraries in the Birmingham area with the aid of funding from the British Library. It is now a very successful widely distributed cooperative and includes a large number of polytechnic libraries, public libraries, county libraries and large city libraries like Birmingham. It has one overseas member at the moment, namely Aarlborg University in Denmark.

The service was set up primarily for cataloguing and is at present operating mainly on a batch system. The system works as follows. If a cataloguer at a member library believes that a book to be catalogued is in the BLCMP database he or she simply sends an ISBN and local information by post to Birmingham. This information is put into a computer and checked against the database in batch mode. If the record is located in the database full cataloguing details are forwarded to the cataloguer who may amend the record as required. If the record is not found in the database the cataloguer fills in a local input form. When the record has been checked it is sent in and finally merged with the full catalogue and is output, usually on microfiche.

As the batch system is rather slow it has been decided to provide an online input facility using a system known as BOSS, the Birmingham Online System Study. A mini computer, linked by a leased line to the BLCMP centre at Birmingham, will be located in each member library. Cataloguers will be able to input records during the day on the mini computer, do some local editing, and dispatch all records via the leased line overnight. These would be matched against the BLCMP database in an offline mode. The results would be transmitted later along the leased line to be stored and checked locally by the cataloguer. The online capability of the system is limited in the sense that it is not as 'online' as BLAISE, on which it is possible to enter an ISBN, and to examine and edit a record immediately.

The BLCMP system is also being developed to include acquisitions and circulation control modules. It is interesting to note that the circulation control module will include an abbreviated author/title entry facility which is intended for online use by ordinary catalogue users i.e. not librarians.

SCOLCAP

The Scottish Library Cooperation Automation Project, SCOLCAP, was set up with the National Library of Scotland (NLS) as the main driving force. It initially involved cooperation between the NLS, some large public reference libraries and a number of large university libraries. It has now been extended from the original six members to include various types of libraries throughout Scotland, and operates on the basis of full and associate membership. SCOLCAP may be considered to be both a logical and physical node of the BLAISE network, because there is a leased line from the NLS to the BLAISE computer in Harlow, near London. A multiplexer, located at the NLS, allows people to dial in from terminals throughout Scotland, at the usual speed of 30 characters per second, and to link directly to the BLAISE computer in Harlow. In addition to catering for physical network requirements the NLS also provides BLAISE training courses in Scotland.

SCOLCAP is mainly concerned with cataloguing at the moment, but there are plans for the provision of information retrieval services and a possible link to EURONET through the BLAISE network. One further point worth noting in relation to SCOLCAP is that it is not entirely restricted to Scottish libraries. Several libraries in the North of England are included in the system.

SWALCAP

The South Western Academic Libraries Cooperative Automation Project, SWALCAP, was initiated by the Universities of Bristol, Bath, Cardiff and Exeter. Bath dropped out at a very early stage, probably because the project appeared to be too slow in getting off the ground. This is one of the problems encountered in setting up a cooperative.

It takes a long time to develop a system which is sufficiently flexible to cope with all the individual needs of member libraries. Bath rejoined at a later stage when the cooperative became established and began to work effectively. SWALCAP members include academic and polytechnic libraries, located mainly in the south and west of Britain, including Wales. Aberystwyth University is now a member and some others are thinking of joining.

It is interesting to note that SWALCAP was initially concerned with circulation control because this was considered to be the main problem facing individual libraries. However, the cooperative has widened its interests and now includes cataloguing and information retrieval services, and has close links with BLCMP and BLAISE.

Non-use of Library Cooperatives

Despite the existence of BLAISE LOCAS, BLCMP, SCOLCAP and SWALCAP, many libraries in the United Kingdom do not use library cooperatives. This is confirmed in a recent article in VINE[2] which indicates that none of the Northern Ireland Library Boards or the Welsh Counties are using cooperatives. Ninety per cent of English counties and metropolitan boroughs, eighty per cent of London boroughs, seventy per cent of universities and thirty six per cent of polytechnics were also found to be non-users of cooperatives.

The reasons for non-participation in library cooperatives may, in some cases, be historical. For example, following local government reorganisation in the early sixties, the London boroughs developed various experimental computer based cataloguing systems to overcome the problem of multiple catalogues. They finally arrived at an in-house solution by producing a common computer based catalogue. Having produced this catalogue, designed to meet their own specific needs, they were probably less motivated than most to join a wider cooperative such as BLCMP. However, Camden Public Library, one of the first libraries to be involved with computers, and having been through all the various stages of catalogue production, has recently decided to join BLCMP.

Although the number of libraries using cooperatives is relatively small, these libraries generally tend to be happy with the cooperative system. Unlike the London boroughs, many libraries have not developed internal computer based systems and have been able to benefit from cooperatives such as BLCMP.

United States and Canada

The Ohio College Library Centre, OCLC[3], is a large cooperative system, used by approximately 1800 libraries mainly for catalogue card production. It is easily accessible from the UK through the TYMNET and TELENET networks. Access from Ireland should be facilitated by the Dublin-London IPSS link described by Dennis Jennings.

BALLOTS, Bibliographic Automation of Large Library Operations, is a library cooperative involving 112 libraries and is based at Stanford University.

WLN[4], Washington Library Network, comprising approximately 24 libraries, is another example of an American library cooperative.

The Canadian system UTLAS[5], the University of Toronto Library Automation System, is fairly active and involves approximately 200 libraries. The National Library of Canada is also planning to set up a network using the DOBIS (Dortmunder Bibliothekssystem) package.

Other Examples of Library Cooperatives

The tendency in Australia has been to establish regional cooperatives such as CAVAL (Cooperative Action by Victorian Academic Libraries), CLANN (College Libraries Activity Network in New South Wales) and SAERIS (South Australian Educational Resources Information System).

In Belgium there are plans to set up a cataloguing system which will link the National Library to university libraries throughout the country.

FAUST, Folkebibliotekernes Automation System, is a Danish cooperative involving public libraries. Swedish systems include a research library cooperative LIBRIS, Library Information System, which has been under development and in operation for some time, and a public library system, BUMS, Bibliotekstjänst Utlånings och Mediakontroll System.

I think it would be appropriate to conclude this paper by quoting Fred Ayres, Deputy Librarian at the University of Bradford, who has written a guest editorial on *"The Code, the Catalogue, and the Computer"* in a recent issue of VINE[6]. Although it is mainly concerned with AACR 2 it contains a paragraph which is quite a good summary of the networking situation.

> *"The last five years have seen cataloguing in Britain and America completely revolutionised by the use of the computer. Change has taken place mainly through networks of one sort or another. The most important of these networks is of course the Ohio College Library Centre, although a number of other networks have sprung up in America and Britain. These other networks have come into being because OCLC was not available, or because it was felt that OCLC has certain inherent defects which could be rectified in a new system. This competition has done nothing but good; it has spurred the new networks to try to continue to improve services. Ten years ago all these networks, if they existed, were tentative, but they have moved forward at an increasing tempo year by year, and it seems almost certain that the tempo will continue to speed up over the next few years".*

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NETWORKING APPLICATIONS IN CATALOGUING - THE IRISH DIMENSION

Patrick Kelly

The contributions from other speakers today have been on a fairly technical level and I originally intended to continue in the same vein by describing the interaction of NIHE Limerick with BLAISE LOCAS. However, on reflection, I think this forum offers a rare opportunity to focus on more important matters such as the broader question of policy, if not politics, and perhaps it may be possible to discuss specifics at a later stage.

Having benefited immensely from the detailed expert contributions on the theory and objectives of networks, a possible physical network for Ireland, and a review of networking overseas, I feel somewhat churlish in asking - so what? How relevant is what is happening in Bath, Birmingham, Edinburgh, Stockholm, or anywhere else one cares to name, to the present situation in Ireland? This question may perhaps be answered by asking another.

- why have SWALCAP, SCOLCAP, BLCMP etc. developed as they have, and are the conditions which generated their development in the UK present at this time in Ireland?

Should we find that a similar situation obtains here, I think we need to ask some more questions.

- should Irish developments in automation and cooperation parallel UK developments, or should we take a radical approach and look westwards towards Columbus, Ohio, rather than eastwards to London, Birmingham or Edinburgh?

A third, and probably the most vital question is

- who will ask these questions - individual institutions, a collective, or collectives?

Finally, when the above questions have been answered, we need to ask

- who will make the decisions as to where and how, and at what cost, we go? and
- who will get things done in the Irish context?

It is already too late to be proposing that such questions be asked because some institutions in Ireland have, in the cataloguing area, asked them already and have gone their own way, doing their own thing, or more exactly, things! I will be examining the edifying details shortly. To return to the question on the reasons for the development of automated cooperatives such as BLCMP and SWALCAP we need to ask why they have automated and why they have cooperated. To answer this question I will quote from Lucy Tedd's excellent book* in which she describes reasons for automation.

- to manage a process more rapidly, more accurately or less expensively
- to help overcome increasing workloads
- to offer new and improved services to users and library staff
- to make use of external services
- as a solution in forming a common system when libraries merge

Why cooperate, and specifically, in cataloguing? The reasons given by SCOLCAP are as follows:

- shared effort and access to cataloguing output of other libraries
- shared system and equipment costs
- shared administrative costs
- shared consultancy costs
- shared information and experience
- share in an influential voice
- independence of the local computer facility

* *TEDD, Lucy A., An Introduction to Computer-based Library Systems, 2nd edition, London, Heyden, 1980.*

Another reason which I personally consider to be vital for cooperation in cataloguing is

- access to high level expertise

I believe that the problems and advantages relating to the above reasons for automation and cooperation will find a positive response in the majority of librarians in Ireland, many of whom have already made judgements and acted within this context. Without going into a detailed analysis I feel reasonably safe in stating that the pressures which generated the creation of at least some of the UK cooperatives also apply in the current situation in Ireland.

We must ask if our response and development should be similar, if not identical, to that in the UK. There are obvious reasons, scale of operation for one, finance for another, why our response will differ more or less, and it is really a matter of asking to what degree we should differ. For example, should we differ to a zero degree in that we become part of one of the UK cooperatives, or to the degree of doing our own thing completely, or to the extent of looking towards a massive proven US utility like OCLC? Some of us are already availing of the UK services mentioned by Lucy Tedd. TABLE I lists nine Irish libraries which have interactions, ranging from the tentative (represented by question marks) to the operational, with BLCMP and the British Library. As developments take place rather quickly in this area, perhaps I will be forgiven if I am not completely up to date.

Several points are immediately obvious from the table. Firstly, there is a predominance of academic libraries, varying in age from the oldest to the newest, and in size from the largest to the smallest. There is also one special library, AnCO, and one public library, Dublin City Libraries (DCL). The point to be made here is that computerisation and cooperation are applicable not only to large libraries and academic libraries, but to all types of libraries. I have included two libraries in Northern Ireland, the New University of Ulster (NUU) and the Ulster Polytechnic (UP). It is interesting to

note that all libraries in the Republic of Ireland are with the British Library, while both libraries in the North are with BLCMP, the NUU having a foot in both camps. Another point worth mentioning is the fact that three (TCD, UCC and NUU) of the six operational systems involve in-house catalogue production and three (NIHE, AnCO and UP) buy in catalogue production.

The two main conclusions to be drawn from this table are that:

- there are nine libraries of various types and sizes which felt the need and found the resources to become involved in this activity
- there is already a disturbing disparity in practice.

The extent of this is apparent from TABLE 2, which is a summary of libraries having operational or near operational systems. It indicates where and how each library obtains and processes its records and physically outputs the result in the form of a catalogue.

In the case of TCD the source of records is the British Library, the mode of capture is MARC tape, processing is done at TCD on a DEC 20/40 computer, software is developed by TCD, output is on fiche, and COM processing is by Microgen.

UCC also obtains records online from the British Library using the selective record service (SRS). Processing is done in-house on an IBM 370/138, using LSP, the British Library's software package, but I understand that the possibility of using DOBIS is currently under consideration. Output is on fiche and COM processing is arranged through the Allied Irish Bank.

At the NIHE (Limerick) the British Library is the source of records, the mode of capture is batch SRS, processing is done totally by LOCAS, output is on fiche, and COM processing is done by NCR, London.

AnCO also uses the British Library as a source of records, employs batch SRS capture and LOCAS processing, outputs on fiche, and uses the

TABLE I

INTERACTION OF IRISH LIBRARIES WITH
UK CATALOGUING SERVICES MARCH 1980.

Library*	Source of Records	Catalogue Production
TCD	BL[1]	in-house
UCC	BL	in-house
UCD	?	?
SPCM	?	?
NIHE (Limerick)	BL	BL
AnCO	BL	BL
DCL	BL	in-house
NUU	BL/BLCMP[2]	in-house
UP	BLCMP	BLCMP

* See ABBREVIATIONS

1 BL = British Library, Bibliographic Services Division

2 BLCMP = Birmingham Libraries Cooperative Mechanisation Project

TABLE 2

Catalogue Automation in Irish Libraries March 1980

Library*	Source of Records	Processing	Output	Mode of Capture	Hardware	Software	COM Processing
TCD	BL	TCD	fiche	MARC tape	DEC 20/40	TCD	Microgen
UCC	BL	UCC	fiche	online SRS[1]	IBM 370/138	LSP DOBIS	AIB
NIHE (Limerick)	BL	LOCAS	fiche	batch SRS	-	-	NCR,London
AnCO	BL	LOCAS	fiche	batch SRS	-	-	BL/RHM
DCL (under development)	BL	DCL	fiche	MARC tape	ICL 1900	NYLONS	?
NUU	BL (current) BLCMP(retro)	NUU	Card/ fiche	online/ tape	ICL 1900	NUU	Comco, Glasgow
UP	BLCMP	BLCMP	fiche	batch selective	-	-	Midland Bank

* See ABBREVIATIONS

1 SRS = selective record service

British Library and Rank Hovis McDougall for COM processing.

Catalogue automation is at present under development at Dublin City Libraries. Records are currently being received from the British Library using MARC tapes, and processing will be carried out on an ICL 1900 using a software package named NYLONS. Output will be on fiche, but it has not yet been decided who will do the COM processing.

The NUU buys in records from the British Library and BLCMP, using online and tape modes of capture. Processing is done in-house on an ICL 1900 using their own software. They have a card catalogue and a fiche catalogue and their COM processing is done in Glasgow.

Finally, the Ulster Polytechnic is the only library in Ireland which buys in a total catalogue service from BLCMP. Output is on fiche and COM processing is done by the Midland Bank.

I must apologise for labouring the details, but the points I wish to make are as follows:

- the British Library is the major supplier of records, in a variety of modes; tape, online, and on a selective basis
- four libraries do their own processing. Two (TCD and NUU) have developed their own software and two (UCC and DCL) have bought in software packages. Three different makes of computers are used
- three libraries (NIHE, AnCO and UP) buy in a total catalogue service, two from British Library LOCAS and one from BLCMP
- all libraries (with the partial exception of NUU) output on fiche and all use different bureaux to process their COM catalogues
- there is not one instance of total compatibility between any two systems
- all libraries are engaged in these activities on an individual basis. In Ireland we have automation, we have computerisation, but we have absolutely no cooperation.

The major point of concern is the level of investment in individual systems designed to meet the needs of specific institutions, particularly larger institutions such as TCD and UCC, where considerable amounts of money and effort have been invested. There is an obvious lack of an overall view in these developments. The data given in TABLE 2 indicates that individual institutions have felt the need to automate their cataloguing procedures for some or all of the reasons mentioned previously. However, the advantages of logical networks (in every sense of the word logical) is either not apparent to these institutions, or there is no mechanism which allows them to express and implement the noted advantages of cooperation. The latter is, no doubt, the case, but who provides the framework for cooperative development? There is no single authority in Ireland with statutory responsibility for all types of libraries. Unlike for example, Denmark, there is nobody to tell us what to do within the different sectors catered for by different libraries. There are, or were, bodies in Ireland having a cohering function within the different sectors, for example, the Higher Education Authority, The Irish Association of Documentation and Information Services (IADIS), the Documentation Coordinating Committee (DCC) attached to the NBST and An Comhairle Leabharlanna (The Library Council).

An Comhairle Leabharlanna is still largely involved with individual authorities in the area of physical provision and systems development in libraries, and I believe it has many years of work ahead in this area. IADIS and the DCC, of relevance to the special library field, have both faded gently into the mist.

Ostensibly, the most promising of all, the Higher Education Authority, instigated an advisory committee on library services in February 1977 with the specific objective of initiating a network among the academic libraries. This committee has prepared a report which has recently been finalised, but as it is a confidential document and has not yet been discussed by the Authority, I am unable to reveal its recommendations. However, it is worth noting that the two major totally independent developments in academic libraries, about which I have expressed concern, have taken place within the lifetime of the

committee. I must also plead guilty myself to going my own way on a lesser scale. Unfortunately I cannot see any potential change in the situation in the immediate future. It is deplorable that such piecemeal development has taken place, but the problems of TCD, UCC, and NIHE are not amenable to postponement while collective solutions are sought.

We are all aware of difficulties with the P & T and problems with equipment, but I am a firm believer that technology is the least of our problems. I have no doubt that we will get our physical network, but will we as librarians have something to run on it? There may be openings for library traffic now, but will the space remain vacant whilst we vacillate on how to fill it? I do not have the answers to these questions but I believe they are relevant and need to be considered.

There are self evident advantages to cooperation. There are also disadvantages. Others have recognised this and have come to terms with both. Of all the organisations mentioned here today, SCOLCAP appears to me to be the most analogous to the Irish situation and has something to offer us. It encompasses a national library, and public, university, polytechnic and institute libraries. It has what is badly needed in this country, a national dimension. It has carried out comprehensive studies, made detailed cost recommendations, and seems to meet the inevitable problems in a flexible and resilient manner. Surely we have a lot to learn from this and other bodies. Is it beyond our collective will and ability to organise ourselves to even learn collectively? The longer we delay the more we will become entrenched in our own particular problems and in evolving individual solutions.

On a more optimistic note it should be mentioned that comparatively small but nonetheless encouraging steps are being taken. In the Mid-West region, at the suggestion of the public library authorities, a study on the possibility of initiating a cooperative cataloguing scheme for four public library authorities, two academic and two special libraries will be undertaken in the immediate future. This initial small scale activity will be funded by An Chomhairle Leabharlanna. The

recent announcement by the British Library of the possibility of creating union and individual files within the LOCAS service, makes such a development realistic. There is also the possibility of some level of physical network development in local government in the Mid-West. The possibility of establishing a physical network is enhanced by the fact that NIHE (Limerick) has an ICL 2904 computer and all local authorities in the area have 2900 series machines. This type of activity is good in that it displays a consciousness of the benefits of cooperation but bad if it, and other similar activities, occur in isolation.

I would like to conclude by answering some, but not all, of the questions posed at the beginning of this paper.

- the conditions which gave rise to the cataloguing cooperatives in the UK and elsewhere apply equally in all types of libraries in Ireland now
- we should not slavishly copy the organisations which have emerged elsewhere, but we must recognise that they have undertaken a massive amount of the necessary analysis which we would ignore at our financial peril
- there is no national body which will undertake the necessary action on our behalf. We must do it ourselves, crossing sectoral boundaries if necessary, and be prepared to give decision making and implementing powers to some form of executive group.

The longer we leave it the more difficult and more expensive it will become. If action is not taken quickly the larger, richer libraries will continue to develop in line with their individual objectives and will be reasonably efficient. The smaller, poorer libraries however, will sink slowly and will eventually lose out in the end.

NETWORKING APPLICATIONS IN INFORMATION RETRIEVAL - EURONET

Barry Mahon

I was somewhat surprised to hear Dennis Jennings say that EURONET was launched only in the last few days. I would like to clarify the fact that it has been in pilot operation since 15th November, 1979 and has actually been available in Ireland since August 1979.

EURONET DIANE is an information retrieval network. EURONET, European Network, is a telecommunications facility provided under contract for the European Community by the nine telecommunications administrations of the European Community. As far as the Commission of the European Communities is concerned EURONET is merely a vehicle. It is already superseded in France. It will be superseded in the UK by the end of 1980, in the Netherlands by mid-1981, and in most countries, including Ireland, within two years. It is used by the Commission only as a mechanism for initiating cooperation in the supply and distribution of scientific and technical information in Europe.

DIANE, Direct Information Access Network for Europe, is concerned with the supply and distribution of scientific and technical information in Europe using EURONET as a vehicle. The concept of DIANE was introduced in 1971 following a resolution of the Council of Ministers. There are two interesting points to note about the resolution. One is that it did not define scientific and technical information, and the second is that it did not define a network. In hindsight, although this may have led to some confusion, it was helpful in that it allowed a certain degree of flexibility in interpretation. It took approximately three years to get the first programme of action off the ground and it was finally approved by the Council in 1975. An interesting historical point is that the President of the Council of Ministers who signed into law, in Community terms, the first action plan on scientific and technical information was Richie Ryan who was then President of the Council of Finance Ministers.

The Council approval of the action plan was for the creation of a telecommunications network which would link all nine member states of the Community to databases available in the Community. The 1975 action plan was, in many ways, an act of faith. Online services were not really established in Europe at the time. IRS had been operational since 1968/69 and had made relatively little progress, and there were very few other people in the online business.

It took some time before a mechanism for implementing the action plan was agreed on, and it was eventually decided to contract the creation of a telecommunications network to the post office authorities. This was the only realistic means of setting up a Community-wide network because the success of the project was totally dependent on the cooperation of the post office authorities. After some delay EURONET was eventually made available to the Commission in August 1979, and to customers, on a pilot basis, in November 1979. At the moment the network is accessible from every member state, and there are approximately four hundred registered customers. Fifteen host computers, offering more than ninety databases, are connected to the network in every member state except Luxembourg, the Netherlands and Ireland.

At this stage I would like to deviate from EURONET and ask the question - how does one get things started, and eventually done? The answer is simple; one provides money. The post office authorities cooperated with the Commission in creating EURONET because they were offered quite a lot of money (twenty five million french francs to be precise) to do, in advance, a job which they would have eventually done in any case. Another means of getting things done is to conduct a market survey to discover what people want. It may be necessary to present the results of the survey in a way which suits one's purpose. For example, a PA study was carried out in 1974 on behalf of the Commission to estimate the potential market for online searches in Europe, and predictions were made for online use in 1979. Because the Commission wanted a network, it emphasised the upper limits of the predicted number of online searches in 1979. In 1974 PA estimated that there would be some 200,000 searches done online in Europe in 1979. The estimate in 1979

however, indicated that the figure was closer to 500,000, thus vindicating the Commission's emphasis on upper limits.

A network or cooperative can be successfully established provided something is to be gained by individual members and it is not seen as a threat or a takeover. The European Commission, for example, always persuades people that there is an advantage in doing whatever it wants them to do. Another means of ensuring the successful establishment of a cooperative or network is to contract the work to a neutral party. In the experience of the Commission this is a means of overcoming the various problems which arise, including personality problems. The advantage of contracting to a neutral party is that it avoids, to some extent, personality clashes and allows objectivity rather than personal interests to play a part in policy and decision making. It also has the advantage of accountability, the contractor being totally to blame if anything goes wrong! Flexibility of commitment is also essential for success. People should be allowed to drop in and out of a cooperative as they wish. The minimum requirement is a few people with a common interest. This is the basis on which EURONET was built.

To continue the EURONET/DIANE saga, it is interesting to look at the policy and political framework of Europe in 1974 when the project was initiated. At that time virtually no country in the European Community had a national policy on information. EURONET, in fact, forced many countries to think about, and eventually formulate, a national information policy in order to blend into an international environment. Germany was the only country with a national policy which at that time was rather farsighted, although it did not take online services into account because it had been developed in the early seventies. France had virtually no national policy, but now has probably the most highly developed information policy of the nine Community countries. It is undoubtedly the most highly developed in terms of investment of resources. A national coordinating body on information was formed in 1971. Until last October it was under the joint control of the Ministry of Education and the Ministry of Trade. It is now one of two bodies in the Prime Minister's office directly under the control of the Prime Minister. It is on the same level as the DGRST which is the

equivalent of the Science Research Council, the principal body concerned with the coordination of scientific and technical research. It has a five year budget of at least one hundred million french francs and has come from nowhere in ten years, because the French used developments such as EURONET as an impetus for the development of a national information policy. As well as taking an international view they also took a French view, i.e. that France should be independent because of the French language and should have a certain independence in information.

The same pressures applied in changing the information policy in Germany. In Belgium and the Netherlands there was almost nothing in the way of national information policies. There is still no formal policy but these countries are now much closer to having a national policy than in 1974/75. In the United Kingdom there has been little change since 1974/75, but there appears to be a greater realisation that information should be handled on a national level.

In Ireland, there has been progress of a kind in that the existence of scientific and technical information has been formally recognised, and is an area for which the recently formed National Board for Science and Technology is responsible. The Board, like many other government bodies in every country, is short of money but there is a coordination point, not necessarily statutory, within its ambit. The fact that this coordinating body has been established will, in time, lead to cooperation and the use of networks.

Looking to the future of EURONET/DIANE, the number of hosts is expected to increase from fifteen to twenty five, and the number of databases to expand from ninety to approximately two hundred, by the end of 1980. Now that the telecommunications network has been established the Commission is concentrating on applications such as information retrieval. The EURONET launch team, which has been placed in my charge, exists because EURONET, although already launched in the formal sense, still has to be developed and exploited. The launch team is now separate from the Commission in the sense that I am a contractor to the Commission and we in the team are responsible for all

operational aspects of EURONET, including the promotional programme. The Commission itself is looking to the next phase of the action programme, the improvement of access to information, and the area which is being given most support is the creation of new information facilities.

The Commission recently published a call for proposals for the creation of databases and information services, and the closing date for receipt of proposals was 28th February, 1980. The response has been enormous. Approximately two hundred proposals have been received. This highlights the fact that people will respond if an environmental framework is created which is designed to get something done. In this case money is the key. The Commission has made no secret of the fact that it is prepared to invest one million units of account (approximately one million dollars) in support of projects in this field. Even with this level of funding however, it will probably be able to support only fifty of the two hundred proposals submitted.

To be successful in producing useful, worthwhile databases and information services the environmental framework I mentioned earlier must contain another element, commitment on the part of those submitting proposals. The Commission is therefore insisting that a proposer should be prepared to pay between 51% and 75% of the costs of a project (in most cases 75%), the remainder of the funds being provided by the Commission for suitable projects. One further point, Commission assistance will be provided for a limited period only, after which the proposer will be expected to bear the full costs.

The fact that two hundred proposals were received is very encouraging and indicates that there are people who believe there is a future in the information business. Although the European Parliament has curtailed the Commission's operating budget to a significant extent the future is not entirely bleak. We are looking for money for a new action programme starting next year and we hope to receive it. There should be more money available and there is considerable incentive for further activity and research in the information field.

When we speak of proposals for information services, or the supply of information, we do not necessarily mean databases only. I have not seen any of the proposals but I know from discussions with various people that they are not restricted to databases. There are people with some very interesting ideas for the improvement of information services, ideas which have nothing whatsoever to do with the creation of new databases. Apart from the criteria of usefulness, originality and international application, the Commission will also be looking for proposals which contribute in a national context and which are supported within each member state.

In providing an information retrieval network such as EURONET/DIANE it is not sufficient to set up a telecommunications network, link it to a number of host computers, and simply tell the customers to get on with it. We have developed some facilities which we feel are essential to the supportive infrastructure of a network. For example, the Common Command Language is a means of standardising the way in which information is retrieved from an online system. At present five of the fifteen hosts are operating the Common Command Language. Another five are in the process of putting it into effect, and we are hoping that by the end of 1980 more than half of the hosts on the network will have the Common Command Language facility. The remainder will eventually see the necessity of adopting it, because customers will tend to use hosts having this facility. In other words the market demand will eventually force all hosts to adopt the Common Command Language.

We have a free enquiry service which can be used to ascertain what computers and files are connected to the network. By autumn of this year we hope to introduce a subject referral service which will provide information on files covering particular subjects. We are also interested in developing subsidiary information services on, for example, documentation available from the Commission and recent reports on scientific and technical information. Finally, we hope to provide a mailbox facility, similar to the one already available on IRS, which will enable people to send messages to one another. This means that the EURONET facility, now that it is available, may be used for the

provision of a wide range of services which help to bring people together. The lesson to be learned from the EURONET project is that once a facility has been set up it may be used for a variety of purposes. It is not a good idea to be too ambitious at the preparatory and planning stages. Priorities must be set and the facility should be developed in a stepwise fashion, and be eventually exploited to the full as it gets off the ground.

I would like to conclude by commenting on the remark by Dennis Jennings that Ireland should not be content to be an importer of information. There is no shame in a small country with limited resources looking for information from other countries with better resources. Luxembourg is by far the smallest country in the European Community. In fact it is smaller, and has a smaller population, than County Cork. It has, nevertheless, managed to get its slice of the European cake and has approximately 10,000 Commission staff working there. It is highly organised and there is no obvious internal squabbling about getting things done. Ireland has a right to its share as a member of the European Community and it will receive its share if it is organised and does not take the attitude "we will do it ourselves". Ireland should look at what is available elsewhere and concentrate on providing supplementary facilities at home. That, in my view, is what applications of networking are about in the information retrieval business.

PANEL DISCUSSION

Colin Barnes (Chairman)

The last event of this afternoon is the panel discussion. I would like to emphasise the word discussion, because I hope this session will involve more than simply asking questions. Everyone is, of course, free to ask questions of the panel, but I would like all of you to participate in the discussion and hopefully you will avail of this opportunity to air your views. Having said that, however, I will now take advantage of my position as Chairman by asking Lucy Tedd a question.

QUESTION (addressed to Lucy Tedd)

Colin Barnes

One of the things you mentioned in your first paper was the alternative forms of government in cooperatives. Do you know if the systems you dealt with in your second paper exhibit different forms of government?

Lucy Tedd

I must admit that I have not analysed that particular aspect of networks. There is a book by Kent and Galvin* about a conference which took place early last year, containing many articles on the government of library networks, mainly in America. One must be careful, however, about the meaning of the word 'network' in the American context. For example, SOLINET, the Southern Libraries Network, or MALINET, the Massachusetts Library Network are referred to as 'networks', but many

* *Kent, A. and Galvin, T.J., The Structure and Governance of Library Networks, Marcel Dekker Inc., 1979.*

of these 'networks' are in fact local or regional bureaux. They have details of library holdings but do not necessarily offer services directly and may only act as agencies through which networks, as we understand them, may be used. So if you decide to read Kent and Galvin's book you should bear this in mind.

As to what has happened in Britain, I think networks such as SWALCAP and BLCMP may have members represented at various levels but I am not absolutely certain of my facts. You are welcome to look at the documentation I have on networks in the UK.

QUESTION (addressed to Lucy Tedd)

Rodney Brunt

What do you consider to be the pros and cons of geographically limited networks such as SCOLCAP as opposed to networks, such as BLCMP, which cover a wide geographical area?

Lucy Tedd

As I said earlier, I have not studied any of these networks in depth and the information I have is based on documentation I have collected. I have not actually visited SCOLCAP. However, all other things being equal, I am sure there is a lot to be gained if everyone in a particular region joins the same system. It certainly makes it much easier for everyone to communicate. Large networks tend to start from small beginnings, for example BLCMP began with three libraries and increased its number to thirty within a few years. I think in such a situation two things may occur. Firstly, the original ideas and objectives may change as the network grows, and secondly, the libraries joining at a later stage tend not to have as much say in development as those who were involved in the network from the outset.

QUESTION (addressed to Patrick Kelly)

Elizabeth McNamara

In your paper you mentioned some of the problems that have hindered cooperation in Ireland. Bearing in mind that Irish people appear to be disinclined to cooperate, do you think that a statutory body should be established to initiate and coordinate activities in this area, or do you feel that progress could be made more easily by a voluntary body?

Patrick Kelly

Let us not say a statutory body because it would take one, or perhaps two decades to set it up! I honestly do not know the answer to your question. Looking at the various national bodies which exist at present I think the only one with potential in this area is An Chomhairle Leabharlanna. It is, as you know, a statutory body but perhaps this is a disadvantage, in that what it can and cannot do is defined by statute. Nevertheless I believe it has potential as a national coordinating body and perhaps the answer may lie in granting wider powers to An Chomhairle Leabharlanna. I do not think it is feasible or necessary at this stage to establish a statutory body.

Noel Hughes

In his paper Pat Kelly has given an excellent summary of the various systems in operation at present in this country. Most libraries and organisations with an interest or role to play in the library and information field are represented at this conference and are now aware of the various systems in operation. We have seen that some organisations in the Mid West are involved, or are about to be involved in networking. Surely it is possible for all librarians to get together and to compromise, perhaps by slightly altering their individual courses and modifying their systems, and to attempt at least some level of cooperation on a national basis.

Patrick Kelly

I did not make any startling revelations in my paper about the various systems in operation at the moment. Ireland is a small country and there has always been a mechanism for people to find out what others are doing. Nevertheless major independent developments have occurred in the academic library area in the last three to four years. Trinity College has been developing its own system, UCC has acquired DOBIS and I believe UCD is also interested in DOBIS. This worries me because if two of the 'big boys' decide to approach the Higher Education Authority and suggest that the whole country should be using DOBIS, what am I to do? I do not wish to be forced to use a particular package just because I happen to be a 'small boy'. It is possible that DOBIS may be perfectly suitable for my purposes, but on the other hand, it may not.

Brian O'Donnell

If a cooperative venture is to be successful one must first ask why cooperation is needed. Lucy Tedd made a profound statement when she said that "large networks start from small beginnings". For example, if we could reach agreement on one small item, such as a standardised interlibrary loan form or a standardised photocopy request form, cooperation might follow from that. It is unlikely that two or more organisations will cooperate unless they have a common problem which is recognised as a common problem.

Patrick Kelly

I agree, the first task in organising cooperation is to define common problems, and computers may not necessarily provide the solutions. It may be a disadvantage being a small community because common problems are often more obvious in larger communities such as the UK and the US. Perhaps something may emerge from the deliberations of the Higher Education Authority. If a network is eventually established among the academic libraries, and all other libraries, be they public or special libraries, are allowed to join if they wish, then we may have a realistic basis for cooperation. But this has not emerged as yet, and

at present it is difficult to predict what the future will bring.

QUESTION (addressed to Barry Mahon)

Norman Wood

You commented on the remark by Dennis Jennings that Ireland should not be content to be an importer of information and implied that we in Ireland have an attitude which you described as "we will do it ourselves". You then went on to say that we should look at what is available elsewhere and concentrate on providing supplementary facilities at home.

The point made by Dennis Jennings was that we are importing too much technology, not too much information, and that we are not in a position at present to even make judgements on the technology available. I see no reason why Ireland should not be an exporter, as well as an importer of information, and I do not think this represents a stand alone attitude. Are you not being inconsistent when you say that we should not provide databases but should concentrate on the provision of supplementary facilities at home. Surely these facilities would include Irish produced databases?

Barry Mahon

I take your point, perhaps I did not make myself quite clear. What I intended to say was that Ireland should not be in such a rush to create a direct input to Europe. I think there are more important things to be done at the moment, such as cooperating in basic library operations. If the compilation of databases brings people together and leads to cooperation it should be seen as a positive step in that direction. If it is intended to produce databases which are unique and are not covered elsewhere, it is also a positive step, but I do not think Ireland should move into the database business simply because of a desire to become more than an importer of information.

QUESTION (addressed to Norman Wood)

Patrick Kelly

May I ask Norman Wood what he would consider to be suitable material for an Irish database?

Norman Wood

I was thinking of a number of small databases concentrating on narrow areas of research. We have in this country some particularly good collections of materials that have both been imported from elsewhere and created here. Examples of areas which might be relevant include peat and marine technology, glassware production, environmental studies, skin cancer research, wind and wave power etc. If we were to compile databases on these topics and make them available on EURONET we would be providing Irish users, as well as EURONET users, with access to material available in Ireland. The irony of the present situation is that we are discussing the advantages of access to European databases when we have little or no access to material in this country.

QUESTION (addressed to the Panel)

Mary Burke

One area which interests me is the inclusion of document supply facilities in cooperative networks. I would appreciate hearing the views of the panel, or members of the audience, on what is being done in this direction in Britain, in the United States, and in Europe. I would also be interested in hearing Pat Kelly's views on how document supply facilities might be organised in the Irish context. It seems to me that one of the main advantages of an information retrieval network, or a cataloguing network, should be the provision of a back-up document supply service.

Barry Mahon

The Commission of the European Communities has examined this area but unfortunately nothing concrete has emerged. It is a problem involving copyright and sensitive political issues and, until it is resolved, online users can expect to encounter some difficulties in document supply. Action is being taken in some countries to improve the situation, but there is no overall coordination of activity. I think the problem is now coming to a head and will have to be tackled in earnest over the next few years.

Patrick Kelly

This question highlights the dichotomy between librarians and information workers, and I believe that an information retrieval system without an attendant document provision system is less than half a solution. In the Irish context we must look at the situation realistically. The National Science Council study* on documentation showed that Irish libraries could have satisfied approximately half of document requests emanating from this country to the British Library. As far as I am concerned this observation is relevant only if it can be shown that Irish libraries are capable of delivering documents as efficiently as the British Library. I am only interested in the most efficient source, and my definition of efficiency includes speed of delivery, work input (i.e. the amount of work involved in submitting a request and obtaining a document) and cost.

* *Carroll, B. and Wood, N., Scientific & Technical Information, the findings of a national documentation use study. A report presented to the Documentation Coordinating Committee of the National Science Council (2 Vols), Dublin, National Science Council, 1978.*

Norman Wood

One of the ways of partially overcoming the international problem of copyright is to encourage the creation of what is now termed 'grey literature', and I understand that there are moves to create a grey literature database for Europe. Grey literature consists of various documents such as research reports, theses, prepublished articles etc. These 'unpublished' documents could be sent to a national centre where they would be put on a database and made available via networks such as EURONET.

As far as document supply in Ireland is concerned, most libraries buy in journals and reports from foreign publishers, pay foreign hosts for using databases to obtain lists of references to documents, and then pay the British Library to satisfy requests for documents that are stored in Irish libraries. Surely there is room for improvement in this situation. The documentation study referred to by Pat Kelly showed that 55% of all requests sent to the British Library could have been satisfied by TCD and UCD alone. This means that if stocks of all academic libraries were exposed for general use, we would have a document supply service which would cater for the majority of home needs and overseas libraries could be used as an additional resource.

Most of you will have heard of the "List of Serials in Irish libraries" which is currently being produced in machine readable form. When this list becomes available in the near future it may be used to locate documents held in libraries throughout the country. Imagine a EURONET user getting a list of references at a terminal. He would then access the serials list at a terminal, identify libraries in Ireland holding the documents he requires, and send off his request immediately. If a mechanism existed to enable Irish libraries to respond to his request there is no reason why he should not have the documents on his desk within one or two days.

I believe this is possible with cooperation and limited resources, provided people are prepared to come together and do something positive.

Colin Barnes

We have heard what networks are and what they can do for us and I think we are all agreed that something needs to be done. However, apart from Pat Kelly's suggestion concerning the An Chomhairle Leabharlanna, we do not appear to have many suggestions as to how cooperation might be achieved. Does anyone have any ideas in that line?

Tom Armitage

I do not have the answer to your question, but perhaps at this stage I might make some general comments. At a recent session given by Lucy Tedd the question of document delivery, in my view a most important issue, was raised. She was describing the services of the BLLD and she practically asked us if we had heard of it! My immediate reaction was to say to her that we are totally integrated in the BLLD service. However, on reflection, the situation is not quite as simple as that. The reality is that in Ireland we have six or more localised inter-lending systems which might be termed 'old boy' networks. This, I think epitomises the Irish situation. On the top line one can describe a situation in a single sentence ("we are totally integrated in the BLLD service") but when one looks at the details one finds variations at local level, or at the base line. The question of interlibrary lending and document delivery was examined in 1974 and it was decided that it would be ludicrous, at that point in time, to attempt to duplicate the BLLD service. An interlibrary lending mechanism and a lending library had been established in Britain and it seemed sensible to join and participate in it. This covers the points made earlier by Pat Kelly and Barry Mahon. The facility is there, so why not use it.

Norman Wood has described the percentage of requests that could have been satisfied by TCD and UCD, and he spoke of documents being provided within one to two days. The reality of course is that neither of these organisations is geared to surface with a document within a fortnight and this is nonsense in terms of time. So one must take Norman Wood's point a step further and say that, if a document supply service is to be made available, libraries such as TCD and UCD must be geared to

produce a document very quickly, otherwise it will be a non-starter.

Another problem we face in Ireland is multi-role playing. We wear different hats, some of us have three, four or even more. It is not an exaggeration to say that it is possible to have two or three committee meetings without a change of personnel. We simply change hats! This familiarity and almost daily interaction of personalities means that we have difficulty in separating issues and in getting things done.

There is, as Pat Kelly said, An Chomhairle Leabharlanna, which has a definite brief in the area of library cooperation. Its ability to function, however, depends on all the organisations which make up the library and information community. It is a flexible body and can, in fact, be what people want it to be. It has been watching very closely the investigation carried out by the advisory committee of the HEA, because it is encouraging to see the academic sector, which has the greater proportion of library resources, investigating itself. If the HEA committee comes up with ideas and plans which lead to what Norman Wood has suggested, then, as a coordinating body, An Chomhairle Leabharlanna would not wish to intervene or take this over, but would nevertheless, be very pleased to see such a development. It is also encouraging to see the NBST undertaking a research project which will eventually produce a union list of serials. An Chomhairle Leabharlanna is prepared to fund it when it ceases to be a research project.

Funding of projects is another area in which An Chomhairle Leabharlanna makes a contribution. It is somewhat disappointing that it is not being inundated with ideas and project proposals, or even criticisms, constructive or otherwise. Last year, for example, £9,500 was left unused for library research. It is not a huge sum, but it was available for that purpose.

An Chomhairle Leabharlanna has set up a committee on library cooperation in the sense that it provides a secretariat. It is there to be used. It is a forum where, in my view, many of the points made here today, should be thrashed out. All sectors are represented, public libraries,

North and South, university libraries, the National Library, and so on. However, it should be clarified that An Chomhairle Leabharlanna should not be expected to do everything. I think it was Barry Mahon who said that the work should be contracted out. The forum exists to get things done, that is if people want to get something done. If the library and information community wishes An Chomhairle Leabharlanna to act as a coordinating body, it will do so and will take on the various roles required of it. Its rationale is that it will move in the direction desired by the community it serves and can function only with the support and participation of that community.

Colin Barnes

Unfortunately we have run well over our time and I must close the proceedings at this point. This has been a most stimulating conference and I trust you will all need to go home and think about what has been said. I can only add one final comment. One theme has emerged from most of the papers presented today. If we are going to build a network in Ireland we must build on what already exists, perhaps beginning with a network in the Mid-West region. Each of us, in our own areas, needs to make a determined effort to cooperate and build something from the ground up. If we succeed in developing a cooperative spirit we already have the mechanisms and organisations necessary for coordination and support. However, as Tom Armitage so aptly put it, these bodies can function only with the support and participation of the library and information community.

PARTICIPANTS

(N.B. - See ABBREVIATIONS for full titles of organisations)

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